

through an expander, a shaft, an electrical generator having a capacity of between about 1 to 10 megawatts operatively associated with said shaft which produces electrical power as a result of the gas flowing through said expander without the combustion of gas, and control means for operating said satellite assembly.

R E M A R K S

Applicant has canceled claims 13-14 and 15-16 and amended claims 1 and 10 to improve the form of the claims and to clearly distinguish the present invention over the cited prior art. It is respectfully submitted that claims 1-6, 10-12 and 15-16 are now in condition for allowance.

Applicant has amended claim 1 to recite a method of generating power utilizing a gas distribution network and claim 10 to recite the structure of the novel satellite assembly. The gas distribution network is comprised of a gas reservoir delivery system and a delivery conduit pipeline to each customer. The gas reservoir is at a pressure greater than the pressure in the delivery conduit pipeline. The method of generating power includes the step of directing a portion of the gas passing through the delivery conduit pipeline, which is free of a heat exchange member driven by a thermal machine and without disturbing the flow of gas, to the satellite assembly to generate power. Importantly, the satellite assembly generates power based upon the flow of gas through the expander and without combustion of gas and has a capacity of between about 1 to 10 megawatts.

The unique and novel method and apparatus for generating power in accordance with the present invention provides an extremely economical method and economical apparatus for generating power by utilizing a portion of the flow of gas passing through the delivery conduit pipeline to each customer to generate power without combustion of the gas. Importantly, the present invention requires that a portion of the gas flow is directed through the satellite assembly or expander to generate power.

The Examiner has rejected the claims as being unpatentable over EPA'398 in view of Amir et al. Applicant incorporates each and all of the arguments previously presented in the Preliminary Amendment filed December 11, 1998 and in the Response filed June 14, 1999 in distinguishing the EPA citation. Accordingly, the following arguments clearly distinguish the claimed method and apparatus from the Amir citation.

Amir's invention is directed to a pressure reducing system for reducing high pressure gas in a transmission line to a low pressure gas in a consumer pipeline (Col. 5, ll. 17 et seq.): Amir's pressure reduction station, in accordance with his invention, is shown in FIG. 2. As described in (Col. 7, ll. 21-22), the flow rate through the consumer pipeline 18A is independent of whether the "expander is operational or not." Also, as shown in FIG. 2, Amir teaches that the control of his system is by a control system 47 which is responsive to the reduction and flow through the expander system below a threshold

for rapidly switching apparatus 40 from its non-operational state to its operational state (Col. 6, ll. 43-49). Thus, in Amir's system, the high pressure gas flows either directly through expansion valve 17A to the low pressure pipeline 18A or, if the pressure regulating valve 17A is closed, all of the gas flows directly through the rotary expander 31 to generate electric power.

To control Amir's system, Amir suggest (Col. 6, ll. 52 et seq.) that a load sensor 42 monitors the level of electrical output of the generator 33. when the output of the sensor, which is directly related to the mass flow of gas through the expander 31, exceeds a threshold, the entire system operates with all of the gas from the transmission line flowing through the expander system and none flowing through the bypass line 45. In other words, as summarized in (Col. 7, ll. 11-15), the size of flow control opening in valve 41 established by sensor 42 at all times would introduce between the transmission line and the customer pipeline, the same flow and pressure drop as currently achieved by the expander system. Manifestly, Amir's invention provides for controlling the size of the flow control opening of the adjustable pressure regulating valve 41 by the output of the expander system, as regulated by the sensor 42. Accordingly, Amir generates power by directing all of the gas through his expander system to generate power and by controlling the flow of gas around his expander system by measuring the output of the electrical power generated by his electrical generator.

Additionally, in Col. 8, ll. 56 et seq., Amir teaches that he generates electricity from power produced by expanders which are usually supplied to an electric grid and which can be cooled by cooling means, such as cooling water. Such cooled generators require a large system, a system in excess of 25 to 50 megawatts or greater to generate power.

In contradistinction, the present invention requires the use of a satellite assembly, having a capacity between about 1 to 10 megawatts, to generate power without the combustion of gas. It is only necessary that the gas reservoir delivery system be at a pressure greater than the gas pressure within the delivery conduit pipeline to each customer. As is known in the art, a reasonable pressure to an individual customer would be one pound or less. Thus, the step of directing a portion of the gas flow in the delivery conduit pipeline without disturbing the flow of gas through the conduit to each customer is a novel method and apparatus which is not remotely taught or suggested by either of the Examiner's prior art references.

For each and all of the reasons set forth above with respect to distinguishing the features of the present invention over the '398 patent and Amir, it is respectfully submitted that

claims 1-6, 10-12 and 15-16 are in condition for allowance.
Applicant has reviewed the prior art made of record and can find
no teaching of the present claimed invention.

Respectfully submitted,

ROBERT M. LUNDBERG

By:  27,184
Paul L. Brown, Reg. No. 27,184

Emrich & Dithmar
300 South Wacker Drive
Suite 3000
Chicago, Illinois 60606
Phone: 312-663-9800
Dated: January 7, 2000